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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/738,321	12/16/2003	Melvin Yamamoto	3572.1	7943

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EXAMINER

SHAW, AMANDA MARIE

ART UNIT	PAPER NUMBER
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1634

DATE MAILED: 02/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/738,321

Applicant(s)

YAMAMOTO, MELVIN

Examiner

Amanda M. Shaw

Art Unit

1634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 8-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☒ Claim(s) 1 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/16/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

Election/Restrictions

1. Applicant's election without traverse of Group I in the reply filed on January 6, 2006 is acknowledged. Accordingly, Claims 1-7 have been examined herein.

Claim Objections

2. Claim 1 is objected to because of the following informalities: the "M" in "Moving" and the "D" in "Detecting" should not be capitalized. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 requires the detection of torsional strain and is dependent on Claim 5, which requires the detection of height deflection. It is unclear if Claim 6 requires the detection of torsional strain and height deflection since it stems from Claim 5 or if Claim 6 only requires the detection of torsional strain.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Tracy et al (U.S. Patent 5847821).

Regarding Claim 1, Tracy et al teach a method comprising: moving an atomic force microscope (AFM) probe over a fiducial; and detecting the topography of the fiducial to facilitate registration. Specifically Tracy et al teach a method for determining the location of defects on a blank wafer caused by particles dropped from process tools (Abstract). First the blank wafer is marked with fiducial marks. Fiducial marks are used because they create topography that can easily be located by a microscope (Column 6, lines 8-10). The position coordinates of the fiducial marks are recorded. Next defects on the wafer are detected and the position coordinates are recorded in relation to the position of the fiducial markers (Column 6, lines 59-67 and Column 7, lines 1-3). Tracey et teach that an AFM can be used to detect the fiducial and the defects on the wafer (Column 7, lines 35-40).

Regarding Claim 2, Tracey et al teach a method wherein the fiducial is on the surface of a substrate. Specifically, Tracy et al teach that the fiducial is on a wafer (Abstract). A wafer is a thin, iridescent, silvery disk of silicon which contains a set of

integrated circuits prior to being cut and packaged. When cut from the wafer these circuits are then called chips and used by companies for microarrays.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tracy et al (U.S. Patent 5847821) in view of Noblett et al (U.S. Patent 6362004).

The teachings of Tracy et al are presented above.

Regarding Claim 3, Tracy does not teach that the fiducial comprises concentric circular ridges.

However, Noblett et al teach that a fiducial can have concentric circular ridges. Specifically Noblett et al teach that fiducials can be an imprinted on the samples surface or may include an etched or frosted region. The fiducial marks disclosed by Noblett can have any predetermined geometric shape (e.g., a circle superimposed with a crosshair as shown, or a set of concentric circles) (Column 5, lines 26-44). The fiducial marks taught by Noblett are on the surface of a microarray and are used to position and align the array for spot placement, analysis or comparison procedures.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Tracy et al so as to have

used a fiducial comprising concentric circular ridges. Using a fiducial comprising concentric circular ridges is beneficial because the raised ridges can easily be detected by an AFM. The concentric circular ridges are an effective type of reference mark which can be used to determine the position coordinates on a substrate with respect to the fiducial.

6. Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tracy et al (U.S. Patent 5847821) in view of Noblett et al (U.S. Patent 6362004) and in further view of Naeem (U.S. Patent 6022136).

Regarding Claim 4, the teachings of Tracy et al and Noblett et al are presented above. In particular Noblett et al teach a fiducial comprising a set of concentric circles. The combined references do not teach that the fiducial further comprises a center hole.

Naeem et al teach a fiducial comprising a hole. Specifically, Naeem et al teach a microscope slide made out of a silicon wafer having fiducials or via holes which allow it to be oriented with respect to the mask (Column 3, lines 46-47). The fiducial in this case allows for in-situ and ex-situ repeated analysis of a biological specimen (Column 1, lines 20-25).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Tracy et al so as to have used a fiducial comprising a center hole in order to have achieved the benefits set forth by Naeem of providing a method in which the fiducial comprising a center hole allows for the substrate be oriented with respect to the AFM probe.

Regarding Claim 7, Tracy et al does not teach that the substrate comprises sites for depositing or synthesizing biological molecules. However both Noblett et al and Naeem et al teach that the substrate comprises sites for depositing or synthesizing biological molecules. Specifically Noblett et al use a microarray as the substrate. Noblett et al teach that DNA or RNA is deposited as an array of target spots, or samples, onto a glass substrate (Column 1, lines 22-26). Specifically the substrate taught by Naeem is a microscope slide in which biological specimens are deposited and studied (Column 1, lines 30-32).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention that the substrate used by Tracy et al could have also been used to deposit or synthesize biological molecules. The substrate taught by Tracy et al is a silicon semiconductor wafer which is often used to make microarrays which are used to study or synthesize a variety of biological molecules. Silicon semiconductor wafers are also used to make microscope slides which can be used to study biological molecules.

7. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tracy et al (U.S. Patent 5847821) in view of Noblett et al (U.S. Patent 6362004), in view of Naeem (U.S. Patent 6022136), and in further view of Elings et al (U.S. Patent 5400647).

The teachings of Tracy et al, Noblett et al, and Naeem et al are presented above. The combined references do not teach the detection of height deflection or torsional strain.

Regarding Claims 5 and 6, Elings et al teach that AFMs can be used to detect height deflection and torsional strain. It is well known in the art that as an AFM scans a surface, forces between the surface and the cantilever tip cause the cantilever to deflect and the topography of the surface is measured by monitoring the deflection of the cantilever. Specifically Elings et al teach that AFMs have a vertical deflection detector (this can detect height deflection) (Column 3, lines 47-50). Elings et al also teach that AFMs have a lateral force detector. When detecting lateral forces the probe tip will not begin to move until the torsional force (torsional strain) or the cantilever bending overcomes the static friction of the tip on the surface of the sample (Column 15, lines 15-24). Therefore, AFMs are also capable of detection torsional strain.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the method of Tracey so as to have used the AFM to detect height deflection and/or torsional strain in order to have provided an effective means for detecting the topography of the fiducial.

Conclusion

8. No Claims are allowed.

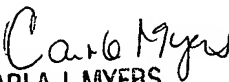
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Amanda M. Shaw whose telephone number is (571) 272-8668. The examiner can normally be reached on Mon-Fri 7:30 TO 4:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones can be reached on (571) 272-0745. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Amanda M. Shaw
Examiner
Art Unit 1634
February 7, 2006


CARLA J. MYERS
PRIMARY EXAMINER